PAPERS

IN

CHEMISTRY.

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The GOLD MEDAL, being the Premium offered for preserving FRESH WATER SWEET during long Voyages, was this Session adjudged to SAMUEL BENTHAM, Esq. of Queen's Square, Westminster, from whom the following Account and Certificates were received.

SIR,

THE Society for the Encouragement of Arts, &c. having thought proper to offer a premium in order to ascertain, for the use of the public, the best mode of preserving Fresh Water sweet at Sea, I request you to lay before the Society an account of the method which I have employed for this purpose on board two ships, and which has been attended

attended with all the success that can be reasonably expected.

The mode in which I conceived Fresh Water might be preserved sweet, was merely by keeping it in vessels of which the interior lining at least should be of such a substance as should not be acted upon by the water, so as to become a cause of contamination. Accordingly, on board the two ships here alluded to, the greater part of the water was kept, not in casks, but in cases or tanks, which, though they were made of wood, on account of strength, were lined with metallic plates, of the kind manufactured by Mr. Charles Wyatt of Bridge-street, under the denomination of tinned copper-sheets; and the junctures of the plates or sheets were soldered together, so that the tightness of the cases depended entirely on the lining, the water having no where access to the wood. The shape of these cases was adapted to that of the hold of the ship, some of them

them being made to fit close under the platform, by which means the quantity of water stowed was considerably greater than could have been stowed, in the same space, by means of casks; and thereby the stowage room on board ship was very much increased.

The quantity of water kept in this manner on board each ship, was about forty tons divided into sixteen tanks; and there was likewise, on board each of the ships, about thirty tons stowed in casks as usual.

As the stowing the water in tanks was considered as an experiment, the water in the casks was used in preference; that in the tanks being reserved for occasions of necessity, excepting that a small quantity of it was used occasionally for the purpose of ascertaining its purity, or when the water in the casks was deemed, when compared with that in tanks, too bad for use.

The water in thirteen of the tanks, on board one ship, and in all the tanks on board the other, was always as sweet as when first taken from the source; but in the other three of the tanks, on board one ship, the water was found to be more or less tainted as in the casks. This difference, however, is easily accounted for, by supposing that the water of these tanks was contaminated before it was put into them; for in fact the whole of the water was brought on board in casks, for the purpose of filling the tanks, and no particular care was taken, to taste the water at the time of taking it on board.

After the water kept in this manner had remained on board a length of time which was deemed sufficient for experiment, it was used out, and the tanks were replenished as occasion required: but in some of the tanks, on board one ship at least, the original water had remained

mained three years and a half, as appears by the certificates herewith inclosed. About twenty-five gallons of the water, which had remained this length of time in the ship, are sent to the Society, in two vessels made of the same sort of tinned copper with which the tanks were lined.

I am, SIR,

Your obedient servant,

SAMUEL BENTHAM.

A certificate from Captain William Bolton, commander of the said vessel, dated Sheerness, 28th of June, 1800, accompanied this letter, stating that the water delivered to the Society was taken from a tank holding about seven hundred gallons, and which his predecessor Captain Portlock had informed him had been poured into this tank in De-

cember 1796, except about thirty gallons added in 1798, and had remained good during the whole time.

The signatures to the above accounts were certified on the 28th of June, 1800, by the

Rev. C. THEE, Minister of Sheerness.

In a letter dated January 27, General Bentham also states, that the water which had been preserved sweet on board his Majesty's sloops Arrow and Dart, and of which he had sent specimens to the Society, was taken from the well at the King's brewhouse at Weevil, from whence ships of war lying at or near Portsmouth are usually supplied with water for their sea store, as well as for present use.

The

The Thanks of the Society were this Session voted to the Rev. EDMUND CARTWRIGHT, of Mary-le-Bone, for the following Communication upon the Production of OPIUM from Lettuces.

SIR,

HAVING lately made a discovery which I have reason to think may in the event lead to consequences of importance, whether considered as an object of science connected with the medical art, or of political economy in influencing an article of commerce, I feel it incumbent upon me to lay it before a Society with whose views it coincides, and to which, from a variety of personal motives, I am zealously attached.

Happening, some time in the month of August last, to read an account of the

process for obtaining Opium from Poppies, I was led to consider the very peculiar nature of the substance which constitutes that most powerful drug.

On turning over the subject in my mind, the different varieties of the lactiferous plants naturally presented themselves to my recollection. From the uniformity which nature invariably observes in her operations, it seemed reasonable to conclude that the milky juice would, in regard to its prevailing property, be alike in all the different kinds of plants from which it is to be obtained; though perhaps more or less narcotic, and probably more or less deleterious, according to the specific quality of the particular plant which might yield it.

There being at that time in my garden a bed of lettuces running to seed (in which state they are known to be more particularly lactiferous), I collected a small quantity of the milky juice; and in a day or two, when it was sufficiently inspis-

inspissated to admit of taking a solid form, I carried it, amounting to about six grains, to my friend Dr. George Pearson, requesting he would bring its properties, in any way he thought most satisfactory, to the test of experiment. The Doctor has since favoured me with the following letter on the subject.

DEAR SIR,

ACCORDING to your request, I have the pleasure of sending you an account of the effects of the dried milky juice of Lettuce-stalks, in the instance which fell under my observation. This instance was John Sheppy, aged nineteen years, who had been ill with what is called chronic rheumatism about two months, so as to be confined to his chair and bed. He had regularly slept every night from about nine to twelve o'clock; but at two o'clock had been uniformly awaked by considerable pains of his

limbs, especially of the elbows, and passed the remainder of the night in a sleepless state.

The sufferer had taken, for several nights preceding the exhibition of the dried Lettuce juice, a scruple in weight of Dover's powder without any relief; and, in place of this medicine, I administered the six grains of dried Lettuce juice at nine o'clock. The consequence was, that in twenty minutes he fell asleep, and slept all night soundly till four in the morning, and a great part of the day following. The next night he also had but slight pain, till the third night, when as usual the paroxysm of suffering returned at midnight. The day after the taking this medicine, the patient was affected with head-ache, and felt a little numbness. He had three evacuations by stool the day following.

On the fourth night after the Lettuce juice had been given, he swallowed one grain

grain of solid Opium, but without any subsequent relief.

On the fifth night *three* grains of solid Opium were given, but still he had a recurrence of pain at night, and passed a restless night, although not so bad as usual; nor by a repetition of opium could the case be effectually relieved. But it was at last cured by frictions with mercurial ointment.

The preceding trial, I apprehend, shews, as decidedly as a single case can do, that the efficacy of dried Lettuce juice, as an *anodyne*, is at least equal to the dried poppy juice, commonly called Opium, if given in adequate doses.

Yours, &c.

G. Pearson.

If it should be found on subsequent trials, that the milky juice of Lettuce possesses, as possibly it may do, all the valuable properties of the common Opium, Lettuces may become an important article of culture for the sake of their milky juice

juice only. But the cultivation of Lettuces has this further advantage over that of poppies:—after having yielded what milky juice can be obtained from them, Lettuces afford very wholesome and nutritious food for cattle, especially hogs, which are known to be remarkably fond of them.

There have not been wanting instances, as I have been informed, of Lettuces having been sown purposely to be given to hogs, particularly when first weaned.

Since writing the above, I find a similar discovery has recently been made in America, the particulars of which are detailed in the last Volume of the Transactions of the American Philosophical Society just published. The experiments that were there tried corroborate the one made by Dr. Pearson.

Yours, &c.

EDMUND CARTWRIGHT.

April 10, 1801.

Mr. CHARLES TAYLOR.